Nebraska Arbovirus Surveillance Report for Week Ending December 3, 2016

CDC Week 48

State Summary:

Protocol: Historically the Nebraska Public Health Lab (NPHL) has tested Culex mosquitoes for West Nile Virus (WNV) using a reverse transcriptase PCR (RT-PCR) assay. Starting last season NPHL began testing Culex mosquitoes for St. Louis Encephalitis Virus (SLE) and Western Equine Encephalitis Virus (WEE) in addition to WNV using a multiplex PCR assay. Testing for all three viruses in mosquitoes will continue this season.

Remarks: Mosquito surveillance and testing has been completed for the season. A total of 2,283 pools consisting of 47,421 Culex mosquitoes have been submitted for testing during the 2016 season. All mosquito pools submitted have now been tested. Note that data may change as more results are received and may not be reflected in the report at the time of publishing. Therefore surveillance results are subject to change. For the most up-to-date numbers on mosquito positive pools visit the Nebraska Department of Health and Human Services West Nile Virus website at: http://dhhs.ne.gov/wnv.

112 positive WNV mosquito pools were detected during the 2016 season from 19 of the 29 counties in the Nebraska WNV mosquito surveillance trap network. Three counties (Chase, Garden and Scotts Bluff) also reported one positive SLE mosquito pool. SLE virus is transmitted by the same Culex mosquitoes that transmit WNV. Clinical symptoms are similar to WNV and while most people infected show no symptoms, serious neuroinvasive disease and death can occur in rare cases. Like WNV the risk of severe disease increases with age. For more information please visit the CDC at https://www.cdc.gov/sle/ . **Mosquito surveillance is now done for the season and no more mosquito pools will be tested**. Prevention of mosquito bites and reducing the risk of WNV can be done by the following precautions:

- Applying an EPA approved mosquito repellant (DEET, picaridin, oil of lemon eucalyptus, or IR3535).
- Limiting exposure when outdoors by wearing long sleeve shirts and pants.
- Limiting time spent outdoors during when *Culex* mosquitoes are most active, typically dusk to midnight.
- Getting rid of standing water that mosquitoes may breed in. Remember to change water in outdoor pet watering dishes along with bird baths and dump out water in flower pots, garden containers, or other objects that may hold water.

The below tables summarize the tested pools. Minimum infection rate (MIR) reported per 1,000 Culex and vector index (VI) are two tools that can be used in assessing the WNV transmission risk. Minimum infection rate is calculated by taking the number of positive pools detected and dividing it by the total number of Culex mosquitoes collected. This proportion is then multiplied by 1,000 to get the MIR per 1,000 Culex mosquitoes. Vector index is calculated by taking the MIR as a proportion and multiplying it by the average number of Culex per trap night collected. Generally, the higher the values for MIR and VI, the greater the potential risk for WNV transmission.

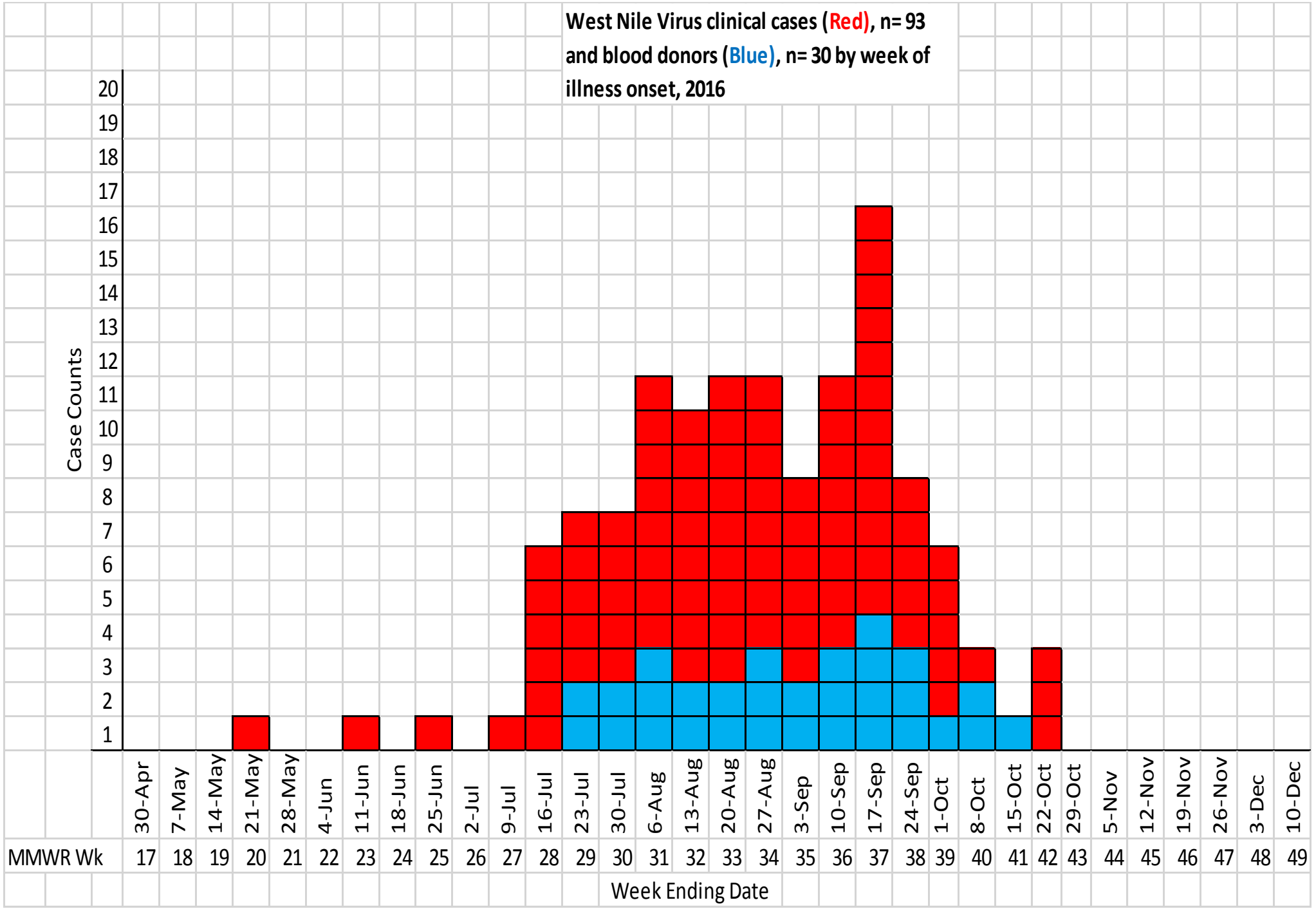
However, it is important to note that there are many factors that also come into play in determining an individual person's risk of acquiring WNV and that MIR and VI are not definitive tools. They are implements that we can use to try and determine high WNV activity and potentially greater risk of WNV infection. **Low WNV activity or no WNV positives detected DOES NOT mean NO RISK!** Anytime mosquitoes are active there is always the possibility of acquiring WNV or another mosquito-borne arbovirus and proper mosquito prevention methods should be utilized.

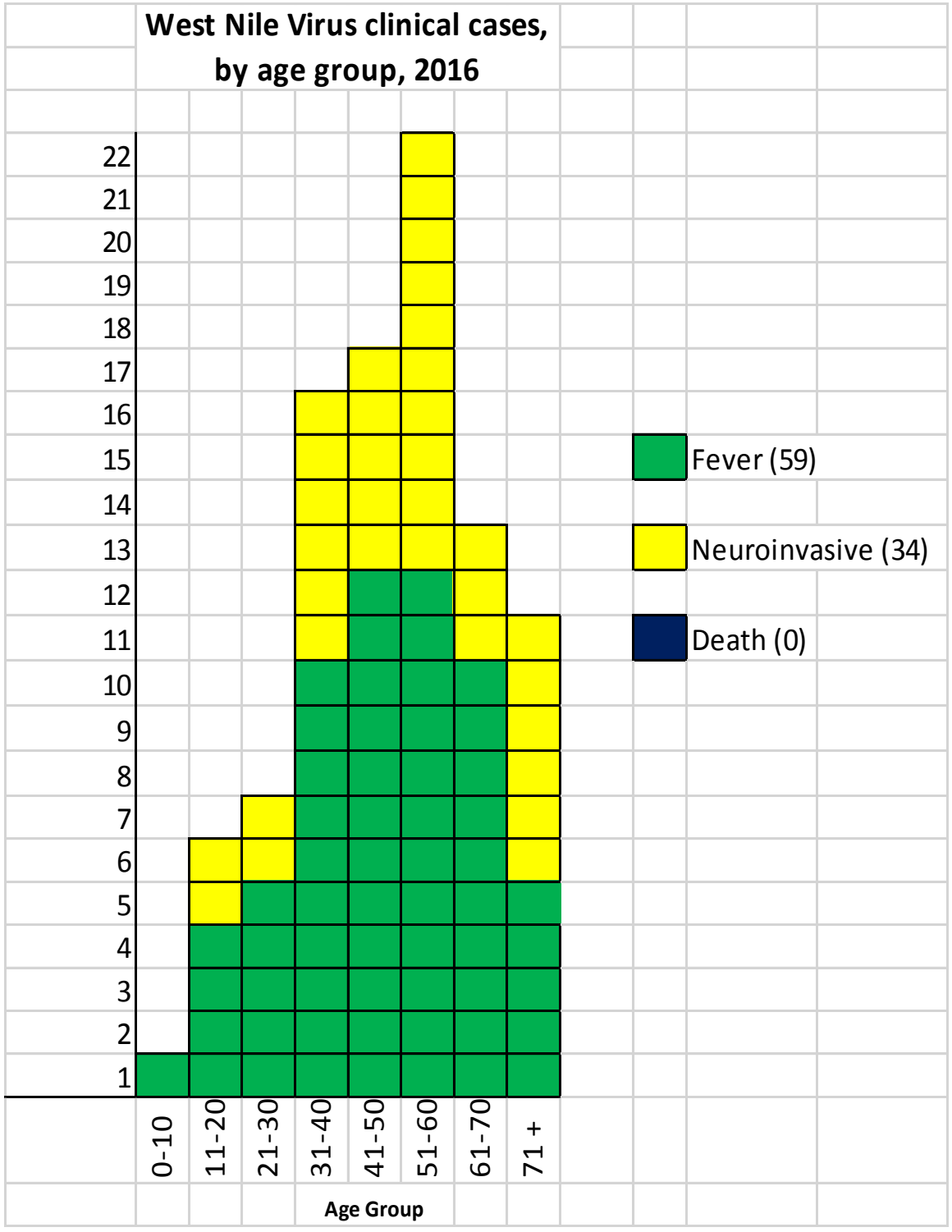
As of December 2, 2016 **93 positive human WNV clinical cases and 30 human WNV blood donors** have been identified to date. There has also been **two birds to test positive** for WNV and **five positive equine WNV case** to report at this time.

2016 Human Clinical Specifics as of December 2, 2016

Age Range	**Number**
0-13	3
14-25	6
26-50	37
51-64	29
65+	18
Gender	
Male	57
Female	36
Diagnosis	
WNV Meningioencephalitis	34
WNV Fever	59
Hospitalized	40
Death	0

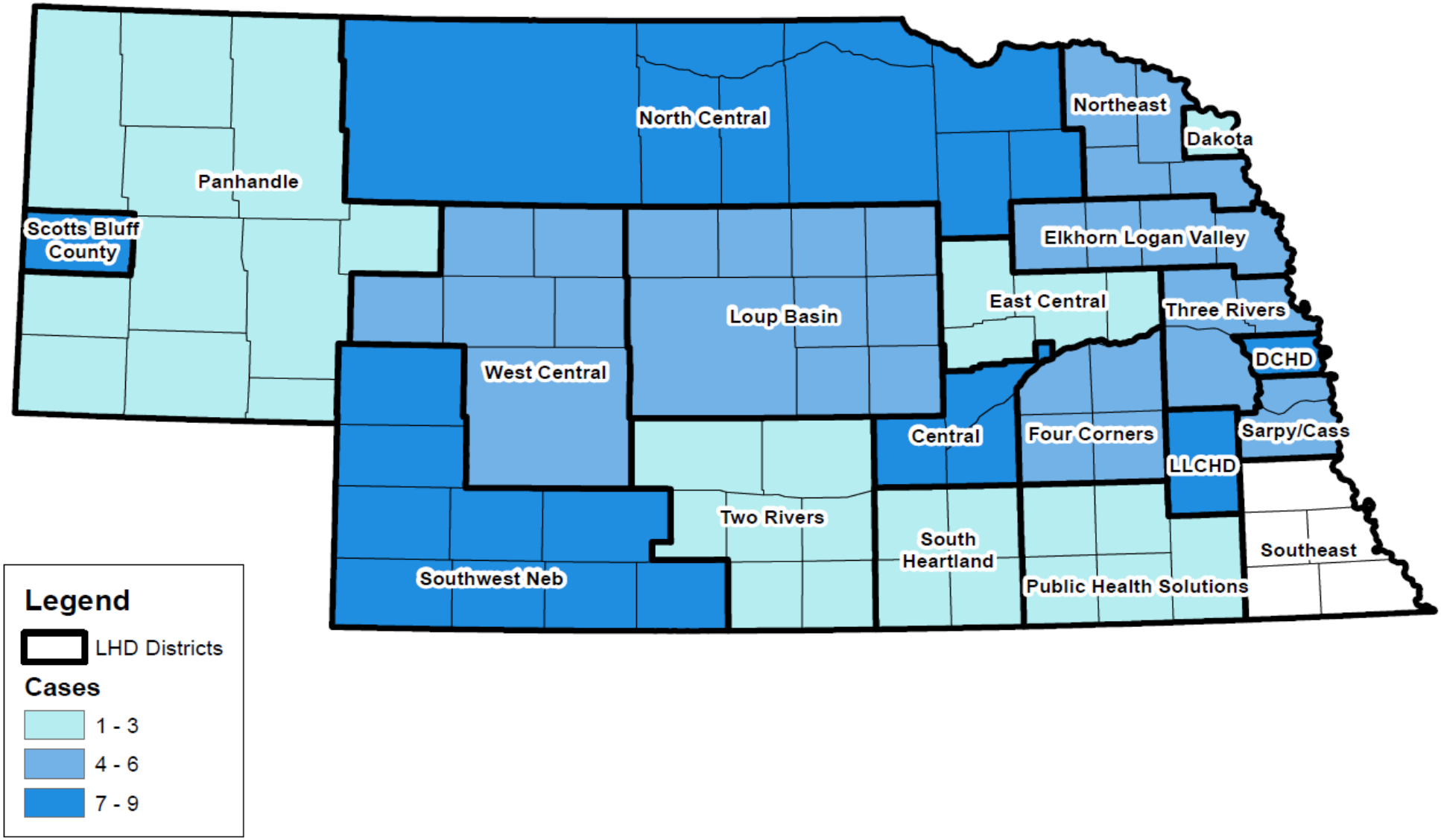
Nebraska Human WNV Cases as of December 2, 2016




West Nile Virus clinical cases, by age group, 2016
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71 +
Age Group
Fever (59)
Neuroinvasive (34)
Death (0)

Human Clinical Positives for West Nile Virus, Nebraska, 2016, (n = 93)

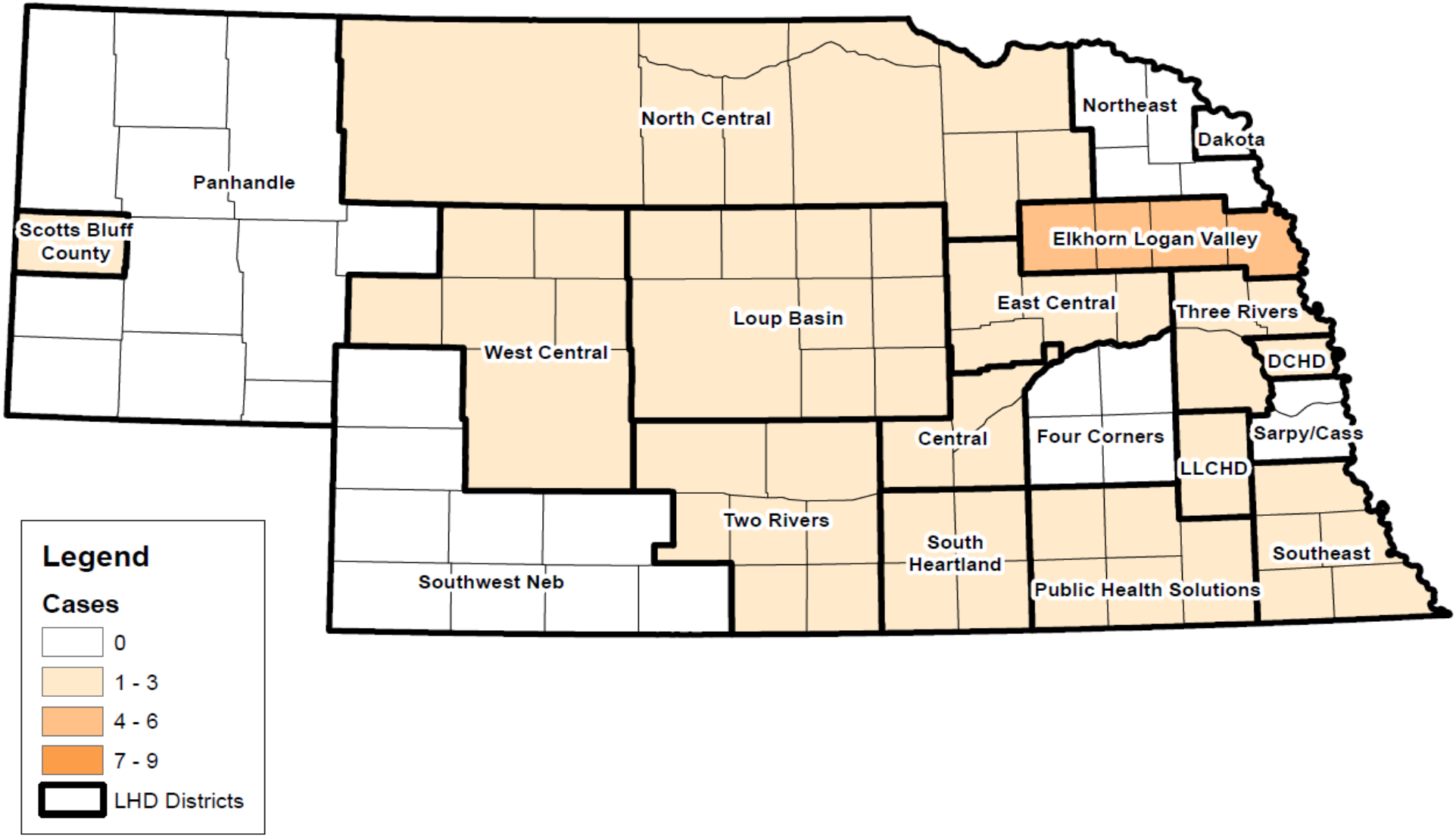
As of December 2



2016 Nebraska West Nile Virus Human Clinical Positives as of December 2, 2016.

Human Blood Donor Positives for West Nile Virus, Nebraska, 2016, (n = 30)

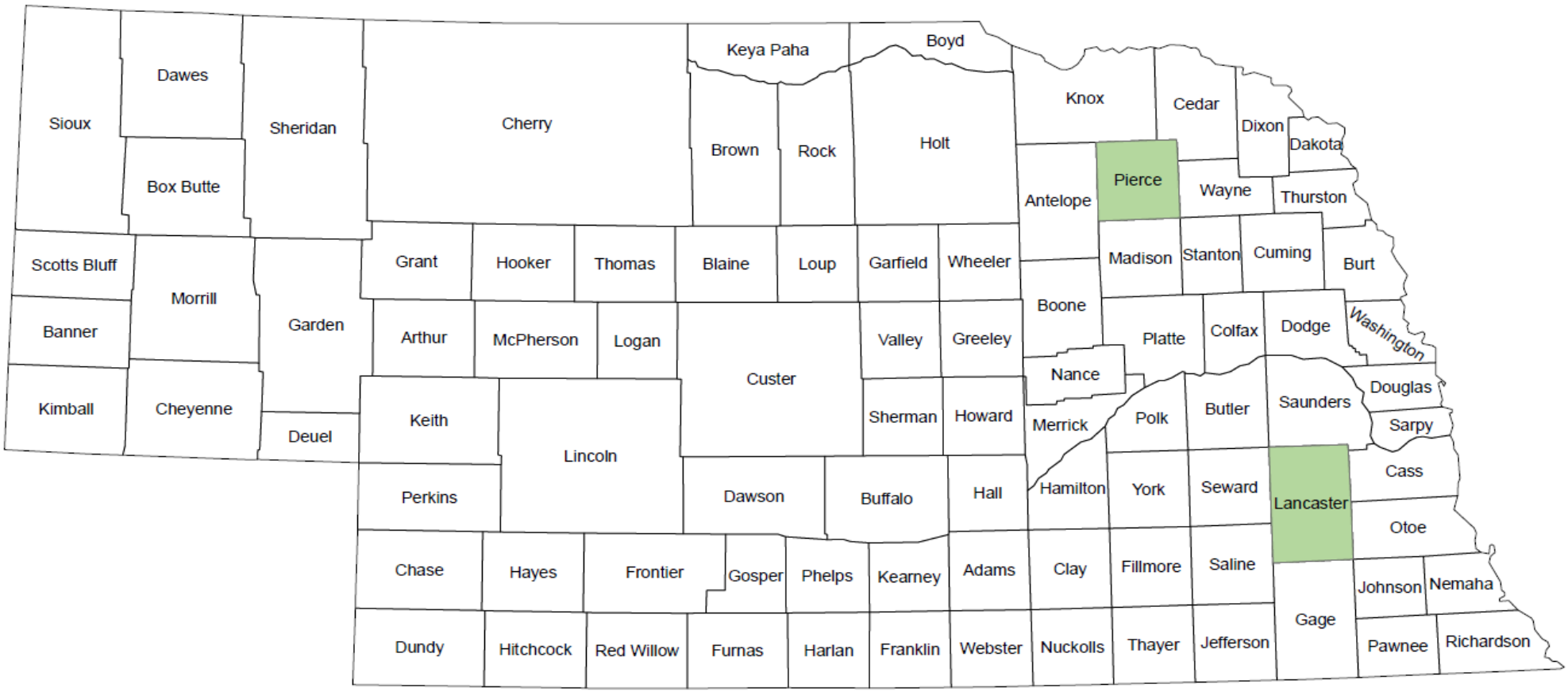
As of December 2



2016 Nebraska West Nile Virus Human Blood Donor Positives as of December 2, 2016.

West Nile Virus Dead Bird Surveillance 2016

FINAL



Legend

Positive

Positive / Tested Totals

Birds: 2 / 6
Counties: 2 / 5

Final Reported Positive Birds 2016

West Nile Virus Equine Surveillance, Nebraska, 2016 (n= 5)

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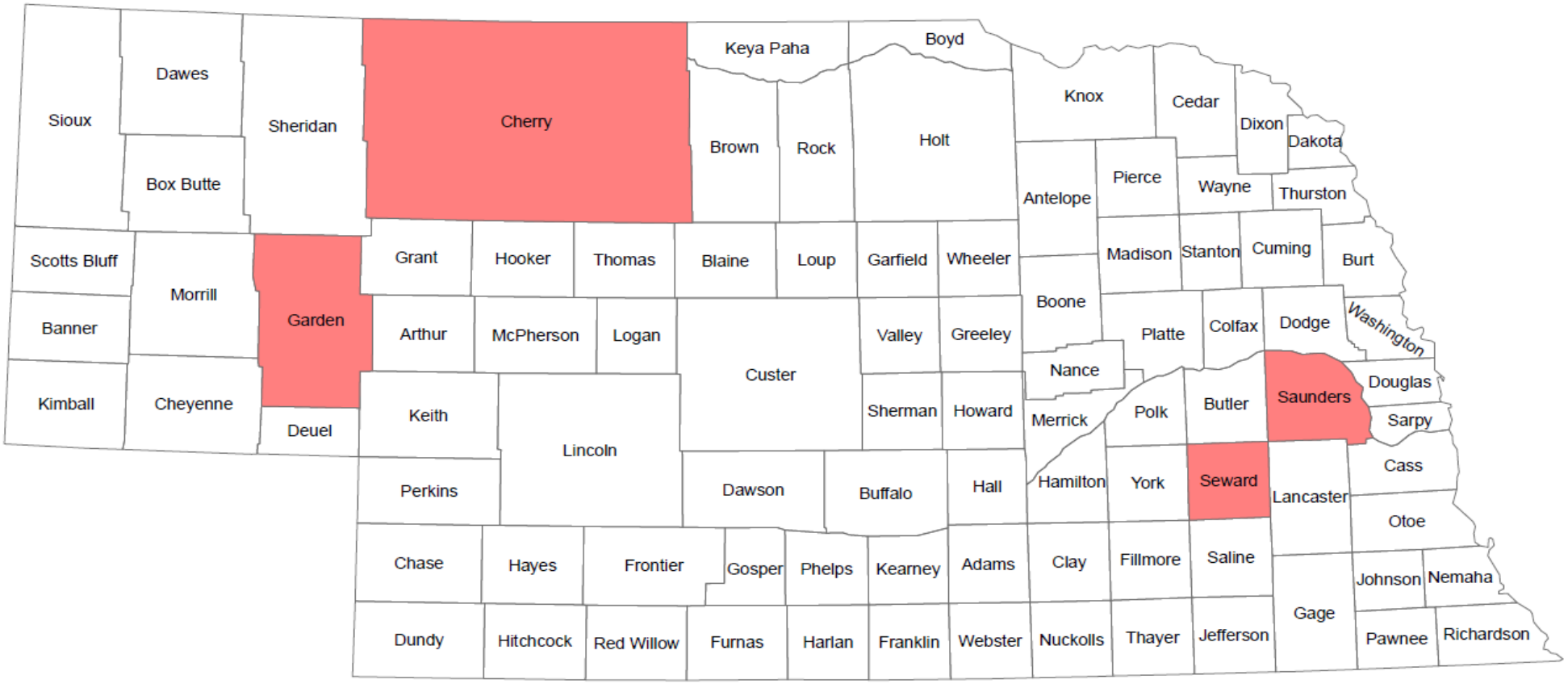

Final Reported Positive Equine Cases 2016

Final Cumulative Nebraska County WNV Mosquito Test Results Table, 2016

County	WNV Positive Pools	Pools Submitted	Pools Tested	Total Culex	Avg. Culex/Trap Night	Infection Rate/1000	VI	% Pos. Pools
Adams	1	21	21	166	11.1	6.0	0.067	4.8
Buffalo	0	27	27	210	4.2	0.0	0.000	0.0
Butler	0	17	17	188	20.9	0.0	0.000	0.0
Chase	11	54	54	1185	26.9	9.3	0.250	20.4
Cherry	1	74	74	2316	42.9	0.4	0.019	1.4
Dawes	0	41	41	729	15.5	0.0	0.000	0.0
Dawson	9	153	153	4052	76.5	2.2	0.170	5.9
Dixon	2	44	44	586	21.7	3.4	0.074	4.5
Dodge	0	68	68	459	9.0	0.0	0.000	0.0
Douglas	6	80	80	588	11.5	10.2	0.117	7.5
Garden	12	112	112	3816	70.7	3.1	0.222	10.7
Garfield	6	143	143	3072	56.9	2.0	0.111	4.2
Hall	6	80	80	1124	20.8	5.3	0.111	7.5
Holt	3	74	74	1014	18.8	3.0	0.056	4.1
Jefferson	6	191	191	5089	96.0	1.2	0.113	3.1
Lancaster	3	142	142	2374	44.0	1.3	0.056	2.1
Lincoln	4	92	92	1963	36.4	2.0	0.074	4.3
Madison	18	244	244	8702	161.2	2.1	0.333	7.4
Phelps	2	43	43	371	7.7	5.4	0.042	4.7
Platte	1	61	61	602	14.0	1.7	0.023	1.6
Polk	0	20	20	226	25.1	0.0	0.000	0.0
Red Willow	0	68	68	671	12.9	0.0	0.000	0.0
Richardson	1	122	122	1572	29.1	0.6	0.019	0.8
Scottsbluff	19	137	137	4409	81.7	4.3	0.352	13.9
Seward	0	15	15	143	15.9	0.0	0.000	0.0
Sheridan	1	43	43	759	15.2	1.3	0.020	2.3
Wayne	0	48	48	604	22.4	0.0	0.000	0.0
Webster	0	51	51	285	5.5	0.0	0.000	0.0
York	0	18	18	146	16.2	0.0	0.000	0.0
2016 Cumulative State Wide Total	112	2283	2283	47421	38.2	2.4	0.090	4.9
2015 Cumulative State Wide Total	103	3717	3717	113628	91.4	0.9	0.083	2.8

Bold Face= Indicates pools remain to be tested from these counties.

Mosquito Surveillance, Nebraska, 2016

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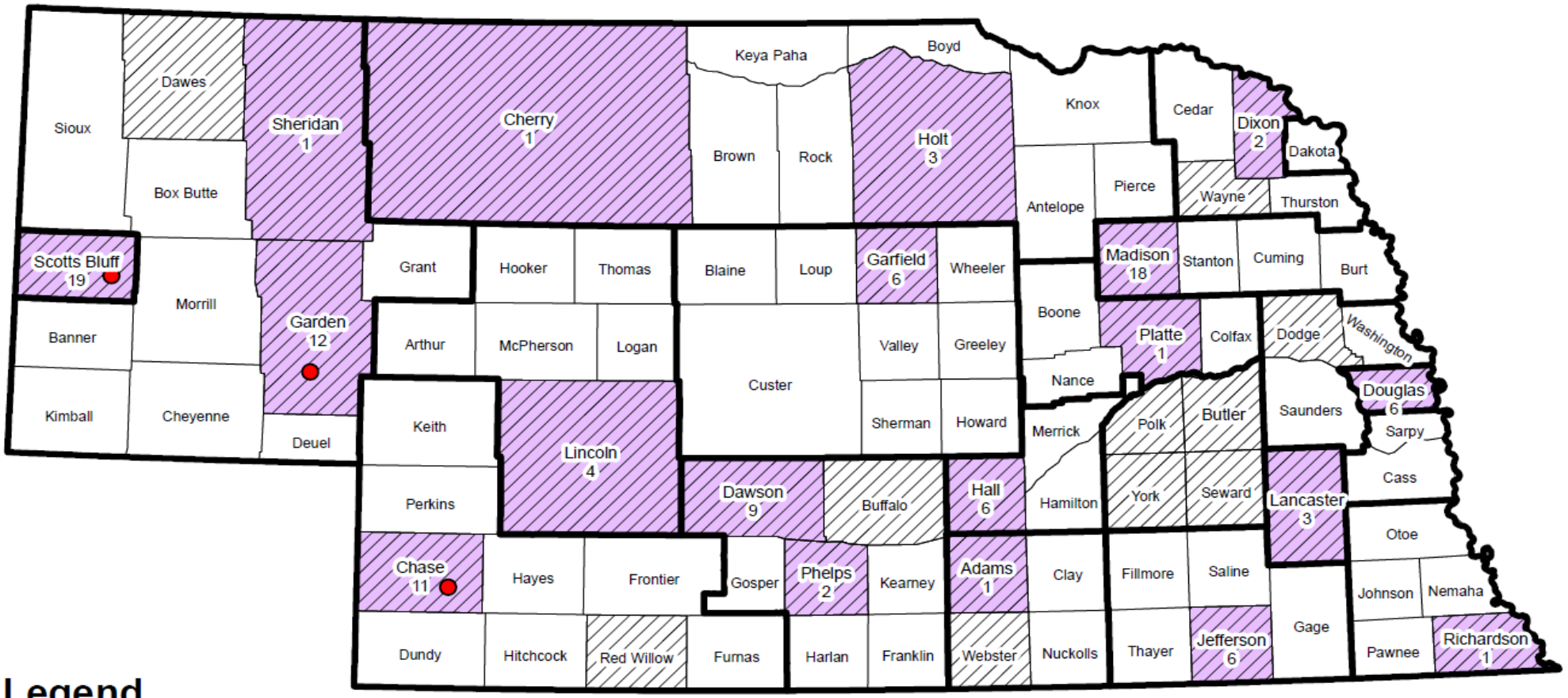


Legend

- West NIle Positive (WNV)
- St Louis Encephalitis Positive (SLE)
- Routine Trapping Sites (29)
- Surveillance Regions

SLE Positive / Tested Totals

Mosquito Pools: 3 / 2283

Counties: 3 / 29

WNV Positive / Tested Totals

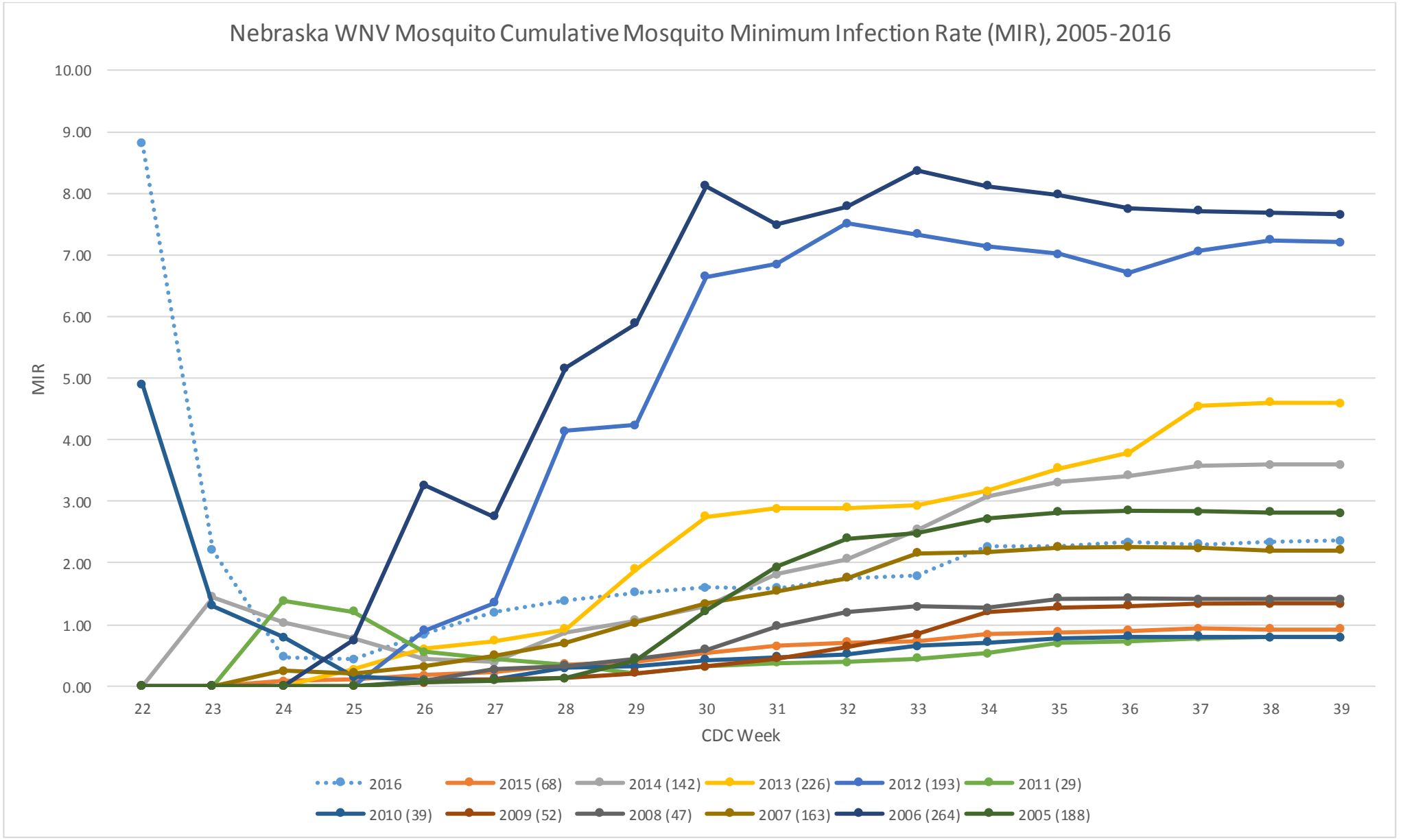
Mosquito Pools: 112 / 2283

Counties: 19 / 29

Final 2016 Cumulative Number of WNV Positive Mosquito Pools by Trap County.

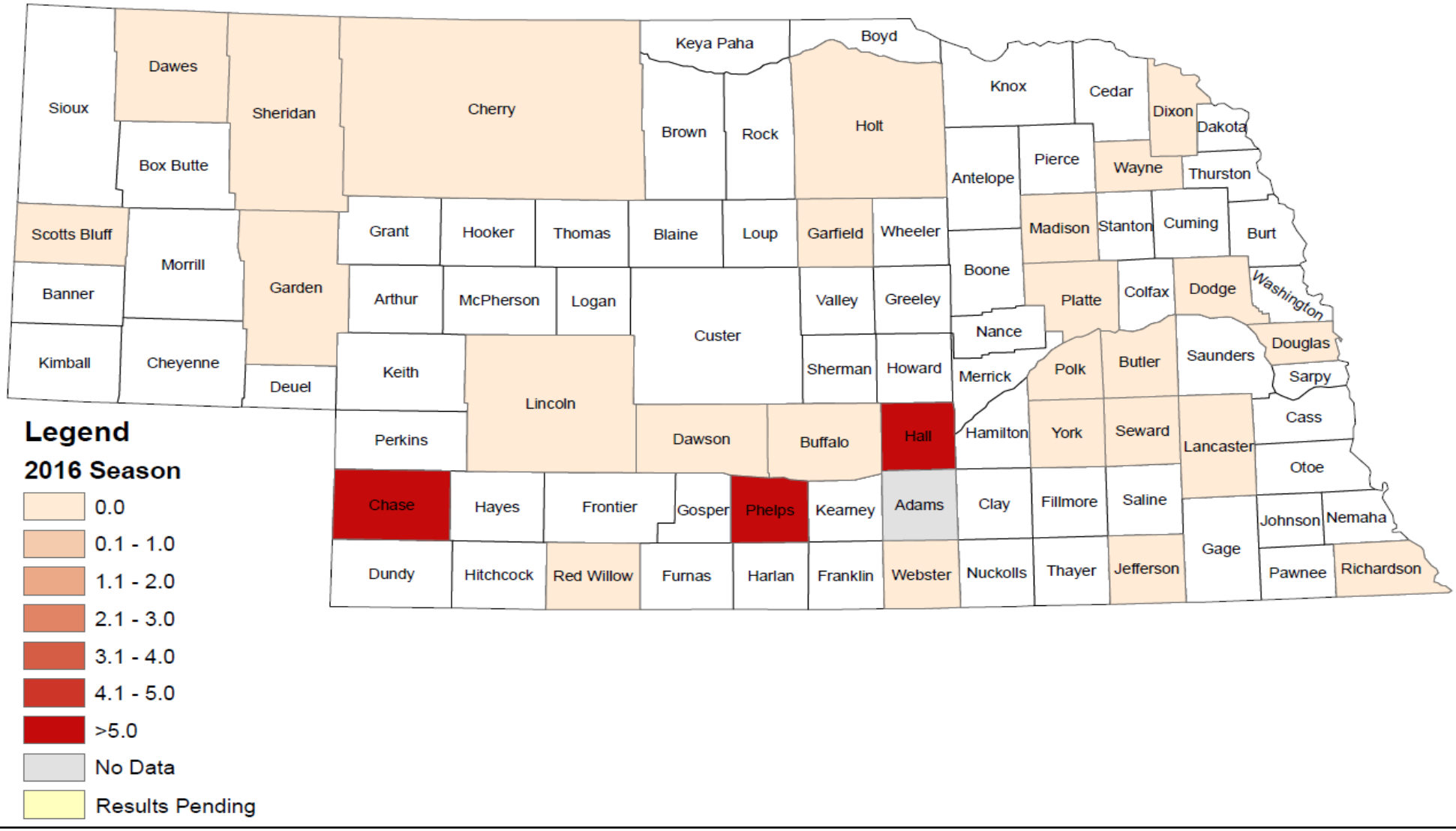
Final Weekly Nebraska WNV Mosquito Cumulative Mosquito Minimum Infection Rate, 2005-2016

At the state level the calculated statewide MIR is strongly correlated (rho= 0.74) with the number of human clinical WNV cases. As such, comparisons of the weekly cumulative MIR with previous seasons MIRs during the season may give an indication as to how severe a WNV season might be. The final overall statewide cumulative MIR was 2.36 and is slightly above the 10 year median MIR of 2.21.



Final Weekly Nebraska Statewide Cumulative Mosquito Minimum Infection Rate, 2005-2016. Note: 2016 data shown as dashed line. Numbers in parentheses next to years indicate the number of human WNV clinical cases reported that year.

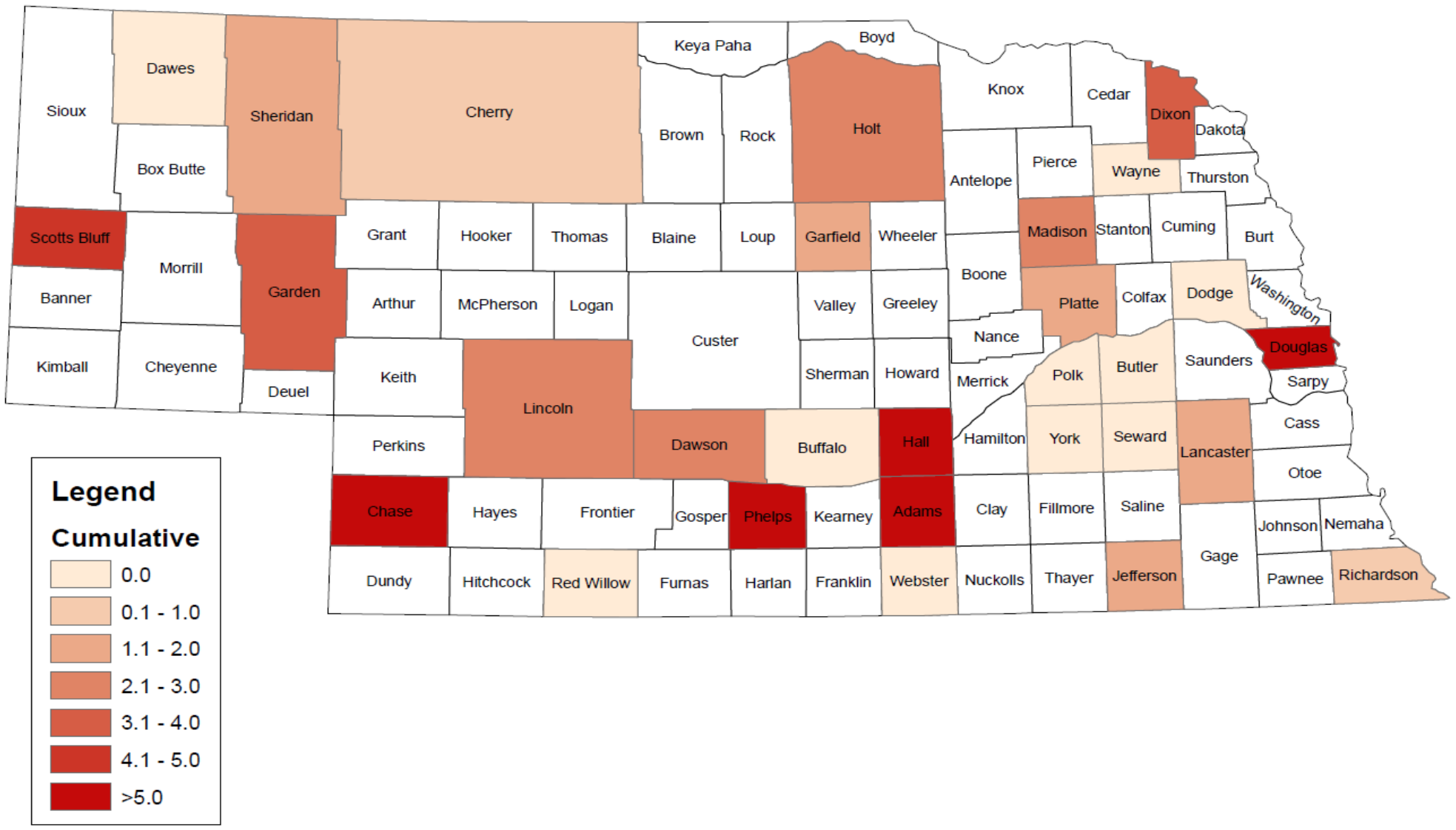
2016 Nebraska Bi-weekly Mosquito Minimum Infection Rates (CDC Weeks 38/39)



2016 Nebraska Biweekly Mosquito Minimum Infection Rates for CDC Weeks 38/39.

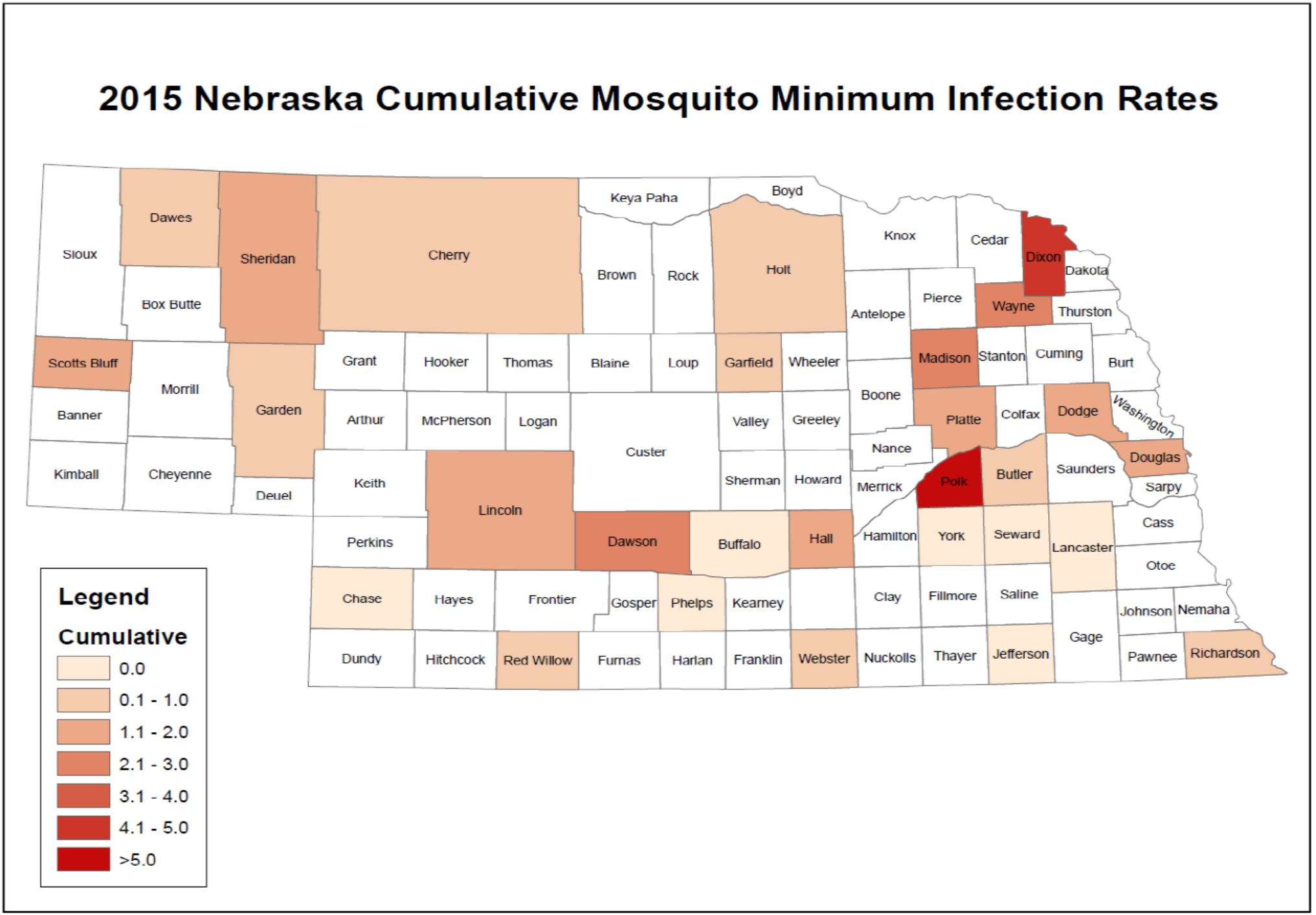
Note: 29 Counties are participating in the 2016 Nebraska WNV mosquito surveillance season.

2016 Nebraska Cumulative Mosquito Minimum Infection Rates



Final 2016 Nebraska Mosquito Minimum Infection Rate (MIR) by County.

Note: 29 Counties are participating in the 2016 Nebraska WNV mosquito surveillance season.



Last Season's (2015) Cumulative Nebraska Mosquito Minimum Infection Rate (MIR) by County.

Note: 28 Counties participated in the 2015 Nebraska WNV mosquito surveillance season.

ST. LOUIS ENCEPHALITIS VIRUS SURVEILLANCE

Final Cumulative Nebraska County SLE Mosquito Test Results Table, 2016

County	SLE Positive Pools	Pools Submitted	Pools Tested	Total Culex	Avg. Culex/Trap Night	Infection Rate/1000	VI	% Pos. Pools
Adams	0	21	21	166	11.1	0.0	0.000	0.0
Buffalo	0	27	27	210	4.2	0.0	0.000	0.0
Butler	0	17	17	188	20.9	0.0	0.000	0.0
Chase	1	54	54	1185	26.9	0.8	0.023	1.9
Cherry	0	74	74	2316	42.9	0.0	0.000	0.0
Dawes	0	41	41	729	15.5	0.0	0.000	0.0
Dawson	0	153	153	4052	76.5	0.0	0.000	0.0
Dixon	0	44	44	586	21.7	0.0	0.000	0.0
Dodge	0	68	68	459	9.0	0.0	0.000	0.0
Douglas	0	80	80	588	11.5	0.0	0.000	0.0
Garden	1	112	112	3816	70.7	0.3	0.019	0.9
Garfield	0	143	143	3072	56.9	0.0	0.000	0.0
Hall	0	80	80	1124	20.8	0.0	0.000	0.0
Holt	0	74	74	1014	18.8	0.0	0.000	0.0
Jefferson	0	191	191	5089	96.0	0.0	0.000	0.0
Lancaster	0	142	142	2374	44.0	0.0	0.000	0.0
Lincoln	0	92	92	1963	36.4	0.0	0.000	0.0
Madison	0	244	244	8702	161.2	0.0	0.000	0.0
Phelps	0	43	43	371	7.7	0.0	0.000	0.0
Platte	0	61	61	602	14.0	0.0	0.000	0.0
Polk	0	20	20	226	25.1	0.0	0.000	0.0
Red Willow	0	68	68	671	12.9	0.0	0.000	0.0
Richardson	0	122	122	1572	29.1	0.0	0.000	0.0
Scottsbluff	1	137	137	4409	81.7	0.2	0.019	0.7
Seward	0	15	15	143	15.9	0.0	0.000	0.0
Sheridan	0	43	43	759	15.2	0.0	0.000	0.0
Wayne	0	48	48	604	22.4	0.0	0.000	0.0
Webster	0	51	51	285	5.5	0.0	0.000	0.0
York	0	18	18	146	16.2	0.0	0.000	0.0
2016 Cumulative State Wide Total	3	2283	2283	47421	38.2	0.06	0.002	0.1
2015 Cumulative State Wide Total	4	3717	3717	113628	91.4	0.04	0.003	0.1

Bold Face= Indicates pools remain to be tested from these counties.

WESTERN EQUINE ENCEPHALITIS VIRUS SURVEILLANCE

Final Cumulative Nebraska County WEE Mosquito Test Results Table, 2016

County	SLE Positive Pools	Pools Submitted	Pools Tested	Total Culex	Avg. Culex/Trap Night	Infection Rate/1000	VI	% Pos. Pools
Adams	0	21	21	166	11.1	0.0	0.000	0.0
Buffalo	0	27	27	210	4.2	0.0	0.000	0.0
Butler	0	17	17	188	20.9	0.0	0.000	0.0
Chase	0	54	54	1185	26.9	0.0	0.000	0.0
Cherry	0	74	74	2316	42.9	0.0	0.000	0.0
Dawes	0	41	41	729	15.5	0.0	0.000	0.0
Dawson	0	153	153	4052	76.5	0.0	0.000	0.0
Dixon	0	44	44	586	21.7	0.0	0.000	0.0
Dodge	0	68	68	459	9.0	0.0	0.000	0.0
Douglas	0	80	80	588	11.5	0.0	0.000	0.0
Garden	0	112	112	3816	70.7	0.0	0.000	0.0
Garfield	0	143	143	3072	56.9	0.0	0.000	0.0
Hall	0	80	80	1124	20.8	0.0	0.000	0.0
Holt	0	74	74	1014	18.8	0.0	0.000	0.0
Jefferson	0	191	191	5089	96.0	0.0	0.000	0.0
Lancaster	0	142	142	2374	44.0	0.0	0.000	0.0
Lincoln	0	92	92	1963	36.4	0.0	0.000	0.0
Madison	0	244	244	8702	161.2	0.0	0.000	0.0
Phelps	0	43	43	371	7.7	0.0	0.000	0.0
Platte	0	61	61	602	14.0	0.0	0.000	0.0
Polk	0	20	20	226	25.1	0.0	0.000	0.0
Red Willow	0	68	68	671	12.9	0.0	0.000	0.0
Richardson	0	122	122	1572	29.1	0.0	0.000	0.0
Scottsbluff	0	137	137	4409	81.7	0.0	0.000	0.0
Seward	0	15	15	143	15.9	0.0	0.000	0.0
Sheridan	0	43	43	759	15.2	0.0	0.000	0.0
Wayne	0	48	48	604	22.4	0.0	0.000	0.0
Webster	0	51	51	285	5.5	0.0	0.000	0.0
York	0	18	18	146	16.2	0.0	0.000	0.0
2016 Cumulative State Wide Total	0	2283	2283	47421	38.2	0.0	0.000	0.0
2015 Cumulative State Wide Total	0	3717	3717	113628	91.4	0.0	0.000	0.0

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